

A DEVICE FOR THE AUTOMATIC CONTROL OF JOINTS  
IN ELECTRICAL HIGH VOLTAGE LINES

CROSS-REFERENCE TO RELATED APPLICATIONS

[1] The present application is a Continuation Application of PCT application Serial Number PCT/SE00/01462, filed on July 8, 2000, which in turn claims priority from Swedish Patent Application 5 Serial Number 99-2664-3, filed July 9, 1999, both of which are incorporated herein by reference.

FIELD OF THE INVENTION

[2] The present invention relates to a device for the automatic control of joints in electrical high voltage lines, comprising a first support, a first wheel for lying on a line, a driving means for driving of said first wheel, at least one second wheel for lying on said line, a measurement unit in contact with means for the measurement of physical data at said joint, comprising at least one pointed element for electrical contact with the line.

BACKGROUND OF THE INVENTION

[3] Such devices are known, e.g., from Sergeström, U.S. Patent No. 5,663,718, issued September 2, 1997 and incorporated herein by reference, Patent Application PCT/SE93/00666, which discloses a device intended to be located on a line for electrical high voltage by a crane or helicopter. This device comprises a number of means for remotely controlled, automatic measurement of physical data at a joint in the line. The device shows, however, some limitations as to the measurement methods, as only pointed elements are provided for electrical measurements.

SUMMARY OF THE INVENTION

[4] Thus, there is a demand for a device of the art mentioned introductory, which enables more active measurement methods. According to the invention, such a device is primarily characterized in that at least one wheel is provided, electrically connected to said measurement unit. In one advantageous embodiment of the device, at least two wheels are provided, electrically connected to said measurement unit, whereas a means for feeding current is provided to feed an electrical current from the first wheel to the second wheel through the line.

[5] In one alternative embodiment of the device, the means for measurement of physical data in the form of at least one pointed element (7,8,9) also comprises at least one wheel (2,3). In one advantageous embodiment of the device it comprises a retainer. 5 journalled in the support, intended to be swung up below the line to increase the pressure of the wheel against same.

BRIEF DESCRIPTION OF THE DRAWINGS

[6] In the following, the invention shall be described in more detail, reference being made to the three enclosed Figures, of 10 which:

[7] Figure 1 is a schematic side view of one embodiment of the present invention.

[8] Figure 2 is a sectional view of a wheel provided with a guide contact.

15 [9] Figure 3 is a schematic end view of a portion of the apparatus of Figure 1, illustrating the swingable retainer.

DETAILED DESCRIPTION OF THE INVENTION

[10] In Figure 1, a schematically indicated support is denoted by 1, a first wheel by 2, a second wheel by 3, and a line, against which these wheels lie, by 4. At least one of these wheels is 5 provided with a driving device, which is not shown.

[11] The line 4 is provided with a joint 5. Both wheels are provided with a glide contact 6, as illustrated in Figure 2. The wheels are such designed, as to the outer diameter D, the inner diameter d, the outer width b, the inner free width e, the fillet radius R, and the opening angle  $\alpha$ , such that both the mechanical 10 and electrical demands are fulfilled.

[12] The included inner sides of the wheel flanges are suitably provided with structured surfaces, e.g., in the form of grooves or other surface form, in order to warrant good electrical contact 15 with the line, when the wheels are used for feeding current, and also when they operate in the same way as the first, second, and third pointed element, which are marked by 7, 8, and 9. They are presented by springs for lying with good electrical contact with the line 4 and the joint 5.

[13] A measurement pair of tongs are all connected to an electric measurement unit 11, which is also connected to an electric current feeding unit 12. The measurement unit 11 may be connected to a control station 13 via an optical fiber, an electric line, or 5 wireless via an antenna 14, as indicated in Figure 1. The pointed elements are, as is mentioned, provided for electrical contact with the line and joint, respectively. They also measure the temperature and transfer data of same to the measurement unit 11.

[14] The wheels may be used as pointed elements as well as for 10 current feed. In Figure 3 there is shown a retainer ("holder-on") S swingable in relationship to support 1, which retainer S is provided to press the wheel from below, when the wheel has come to lie at the line 4, to warrant electrical contact. Retainer S may also be used for transfer, together with wheel 2, current to line 15 and joint 4,5 in order to get better current distribution in these.

[15] The device is lifted to the actual line and shall first be positioned. For positioning of the device, including the joint, that shall be measured, and measuring the diameter of the line and the joint respectively, position indicators in the form of distance 20 gauges are used, preferably of the laser type. In Figure 1, they are marked by 16 and 17. Furthermore, here one not shown rotational position indicator is used for measurement of the